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EXAMINER

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/827,843

Applicant(s)

ONG ET AL..

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-28 is/are rejected.
- 7) ☒ Claim(s) 12-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. In response to the amendment received October 2, 2003:
  - a. Claims 1-28 are pending;
  - b. The drawing objections have been withdrawn in light of the amendment to the claims;
  - c. The specification objections have been withdrawn in light of the amendments to the specification and claims;
  - d. The 112 rejection has been withdrawn in light of the amendment;
  - e. The prior art rejections of record are withdrawn in light of Applicant's arguments.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-11, 16-22 and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated JP 09-326259-A (JP '259).

JP '259 discloses a solid oxide fuel cell (abstract), comprising: a planar first and second interconnects that allows a first gas to flow therein; a planar ceramic cell

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between and adjacent to the two interconnects (Figs. 4a and 4b) a plurality of gas tubes 22-25 in gas communication with said ceramic cell, said gas tubes comprising: a gas inlets 22 and 24 in communication with respective gas outlets 23 and 25 (Figs. 4a and 4b as applied to claims 1 and 16).

At least one of said first and second gas outlets comprise a tube affixed to at least one of said first and second interconnects (Figs. 4a and 4b as applied to claim 2).

At least one of said first and second gas outlets comprise a plurality of openings in at least one of said first and second interconnects. The interconnects having a plurality of openings (Fig. 6 as applied to claim 3).

The first and second gas inlets have cylindrical shapes (Figs. 4a and 4b as applied to claim 4).

The first gas inlet is affixed adjacent an intersection of two sides of said first interconnect and said second gas inlet is affixed adjacent an intersection of two sides of said second interconnect (Figs. 4a and 4b as applied to claim 5).

The first gas inlet is affixed at a middle area of a side of the central first interconnect and said second gas inlet is affixed at a middle area of a side of the central second interconnect (Fig. 4b as applied to claim 6).

The gas channels 22-25 are disposed parallel to one another (Figs. 4a and 4b as applied to claim 7).

The first gas inlet is disposed substantially perpendicular to said second gas inlet (Figs. 4a and 4b as applied to claim 8).

The circular tubes are straight as shown in Fig. 4b and thus have a straight shape (as applied to claim 9).

The gas tubes are T-shaped (Fig. 4b as applied to claim 10).

The tubes have a cross member portion and an inlet portion (Fig. 4b as applied to claim 11).

Each interconnect has 4 sides (Figs. 4a and 4b as applied to claims 17 and 18).

Each interconnect are adjacent to each other on opposite sides of the fuel cell (Figs. 1 and 3 as applied to claims 19 and 24).

The fuel inlets and outlets are secured in the interconnects (Fig. 4b as applied to claims 20 and 25).

The fuel and oxidant is flown in a cross pattern across the cell and a co-flow pattern along side the cell (Figs. 4a and 4b as applied to claims 21, 26 and 28).

#### ***Response to Arguments***

4. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6, 9, 16-20 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 04-342439-A (JP '439).

JP '439 discloses a solid electrolyte fuel cell comprising: planar first and second interconnects 9 and 11 disposed between a ceramic electrolyte (abstract and Figs. 2 and 3), gas tubes 6 and 7 are connected to respective interconnects 9 and 11 (Fig. 3 as applied to claims 1 and 16).

The gas outlets comprise tubes 6 and 7 (Fig. 3 as applied to claim 2).

A plurality of openings are in the interconnects 9 and 11 (Figs. 2 and 3 as applied to claim 3).

The gas flows are perpendicular to one another (Fig. 3 as applied to claim 8).

The tubes 6 and 7 have a straight shape (Fig. 3 as applied to claim 9).

The interconnects includes 4 sides (Figs. 2 and 3 as applied to claims 17 and 18).

The interconnects 9 and 11 are adjacent to one another on opposite sides of the cell 10 (Figs. 2 and 3 as applied to claims 19 and 24).

The outlets are secured on the second sides of the interconnects (Fig. 3 as applied to claims 20, 25 and 27).

The fuel is flown in a cross flow pattern (Fig. 3 as applied to claim 26).

The differences between JP '439 and claims 1, 4, 5 are that JP '439 does not show first and second gas inlets connected to respective interconnects (claims 1 and 16), that these inlets have cylindrical shapes (claim 4), that the gas inlets are affixed to respective intersections of two sides of respective interconnects (claim 5, of the inlets

affixed at a middle area of respective sides of the interconnects (claim 6), of the shapes of the inlet tubes (claim 9), of the inlet and outlets being secured on opposite sides of the interconnects (claims 20, 25 and 27).

JP '439 discloses means 6/15b and 7/15a for exhausting gases across the span of the fuel cell width. One of ordinary skill in the art would have found it obvious to use the same configuration for the fuel and gas inlets as the fuel and gas outlets and dispose these inlets on the sides opposing the gas outlets since it would have provided means for supplying fuel and oxidant gases to the respective interconnects and flow these gases across the fuel cell (as applied to claims 1, 4-6, 9, 16, 20 and 25).

7. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '259 in view of JP 57-138782-A (JP '782).

The teachings of claims 16-19, with respect to JP '259 have been discussed above.

As discussed above the fuel and oxidant are co-flown alongside the fuel cells (Fig. 4b as applied to claim 23).

The difference not yet discussed is of disposing the fuel inlet and outlet on the same side of the interconnect and the gas inlet and outlet on the same side of its respective interconnect (as applied to claim 22).

Note this return arrangement provides fuel and oxidant flows which are both co-flow and counter-flow (Fig. 4).

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JP '782 discloses that it is known to configure the fuel inlet and outlet on a single side of the interconnect and the oxidant inlet and outlet on a single side of the opposing interconnect (Fig. 4).

The motivation for providing this arrangement is that it 4 reduces the complexity of the system. Furthermore by providing a u-shape to the flow paths it increases the time of exposure of the fuel and oxidant to the fuel cell thereby increasing the gas utilization efficiency of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '259 by configure the fuel inlet and outlet on a single side of the interconnect and the oxidant inlet and outlet on a single side of the opposing interconnect since it would have reduced the complexity of the system and since providing a u-shape to the flow paths would have increased the time of exposure of the fuel and oxidant to the fuel cell thereby having increased the gas utilization efficiency of the fuel cell.

### ***Response to Arguments***

8. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Allowable Subject Matter***



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9. Claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

See item 16 in the previous office action, incorporated herein. As with Chen, neither JP '259 nor JP '439 teach or suggest the cross member arrangement as recited in claims 12 or 14.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPATs 4,857,420 (Fig. 1), 4,659,559 (Figs. 1 and 5), and 4,596,748 (Fig. 1) are pertinent to the disclosure and claimed invention.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. Note that these telephone numbers will change around January 1, 2004. At such time the examiners new telephone number will be (571) 272-1283 and the examiner's supervisor's number will be (571) 272-1292. FAX communications should be sent to FAX number: (703) 872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application

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or proceeding should be directed to the receptionist whose telephone number is (703)  
308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

gc



December 3, 2003